

Appl. No. 10/529,780

Reply to Office Action mailed October 17, 2007

R E M A R K S

The amendment to claim 1 regarding the viscosity is supported in the specification on page 13, lines 6 to 10. Also, the features of claim 12 were added to claim 1.

New claim 28 is supported in the specification on page 13, lines 6 to 10.

Claims 8 and 22 to 27 were rejected under 35 USC 103 as being unpatentable over USP 6,191,212 to Kube and in view of USP 5,288,839 to Greco for the reasons set forth in item nos. 3 to 7 on pages 2 to 4 of the Office Action.

Claims 9 to 14 were rejected under 35 USC 103 as being unpatentable over USP 6,191,212 to Kube in view of USP 5,288,839 to Greco and further in view of USP 6,821,110 to Carlson et al. for the reasons set forth in item nos. 8 to 10 on pages 4 to 5 of the Office Action.

It was admitted in the October 17, 2007 Office Action that Kube and Greco fail to disclose a molded product formed from a hot-melt composition (as defined in item no. 8 of the Office Action) that is useful in the semiconductor industry.

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It was admitted in the May 2, 2007 Office Action that Greco is silent regarding the amounts of the polyester polyol and possible substrates.

It was also admitted in the May 2, 2007 Office Action that Kube and Greco are silent in teaching a metal substrate.

The present claims are directed to a reactive hot melt composition obtained by reacting

(i) a polyol mixture comprising

(1) 30 to 90% by weight of a crystalline polyester polyol having a number average molecular weight of 1,500 to 10,000, produced from at least one aliphatic dicarboxylic acid and a first aliphatic diol as main components,

(2) 5 to 30% by weight of a polyester polyol having a number average molecular weight of 1,500 to 10,000, produced from at least one aromatic polycarboxylic acid and a second aliphatic polyol as main components, and

(3) 5 to 40% by weight of a polycarbonate polyol having a number average molecular weight of 500 to 5,000,

and

(ii) a polyisocyanate,

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wherein a molar ratio of the OH group of the polyol mixture to the NCO group of the polyisocyanate is 1:1.7 to 1:2.5, the composition has a viscosity at 120°C of 200 to 40,000 cps, and the composition is used as a molded product in the fields of an electric and electronic parts producing industry and a semiconductor parts producing industry.

Applicants' Claims 8 and 22 to 28

In applicants' present claims, by using (1) a crystalline polyester polyol, (2) a polyester polyol and (3) a polycarbonate polyol as starting materials for a hot melt composition with specific molar ratio of the OH group of the polyol mixture to the NCO group of the polyisocyanate, a hot melt composition is provided having a viscosity which is advantageous for encapsulation of an electric or electronic part by injection molding as described on page 10, lines 3 to 10 of the present specification.

Kube (USP 6,191,212) teaches a moisture-curing holt-melt adhesive containing polyurethane prepolymers with an isocyanate group which is obtained by reacting crystalline polyester

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polyols, optionally mixed with liquid and/or amorphous polyester and/or polyether polyols having an isocyanate functionality greater than one as described in the abstract thereof.

Kube is silent in disclosing polycarbonate polyol present in the polyol mixture as stated in the last two lines of item no. 4 on page 3 of the Office Action.

Greco (USP 5,288,839) teaches diol-terminated polycarbonates (i.e., polycarbonate diol) for the synthesis of prepolymers which are used in reactive adhesives and/or sealing formulations of the hydro-, photo- or thermo-setting type as disclosed in column 1, lines 4 to 8 of Greco (USP 5,288,839).

Greco also discloses the use of crystalline polyesters mixed with amorphous polyesters as disclosed in column 1, lines 48-56 of Greco to reduce shrinkage in the crystalline phase and to increase the initial tack. In Greco, there is thus a reference to crystalline polyesters and amorphous polyesters, but there is no teaching or suggestion of a crystalline polyester polyol and a polyester polyol, as recited in applicants' claims.

It is therefore respectfully submitted that one of ordinary skill would not consider to combine Kube and Greco.

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If, however, the teachings of Kube and Greco are combined, a composition comprising a polycarbonate diol (of Greco) and a crystalline polyester polyol (of Kube) might be obtained. However, it is respectfully submitted that one of ordinary skill in the art, based on the disclosures of Kube and Greco, would not arrive at a composition comprising (1) a crystalline polyester polyol, (2) a polyester polyol and (3) a polycarbonate polyol, each having a specific molecular weight with a specific ratio of the OH group of the polyol mixture to the NCO group of the polyisocyanate, as recited in applicants' present claim 8.

By using the polyol mixture comprising the three components (1), (2) and (3) as discussed above, and as recited in applicants' present claim 8, a reactive hot melt composition having an excellent adhesion to a metal, particularly to aluminum, can be obtained as described on page 22, lines 21 to 29 of the present specification. It is respectfully submitted that such an excellent result would not be obtained from the combined teachings of Kube and Greco.

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Applicants' Claims 9 to 14

Kube and Greco were discussed hereinabove.

Carlson et al. (USP 6,821,110) discloses merely polyamide hot-melt compositions that are molded in injection-molded machines. In column 3, line 49 of Carlson et al., a "polyamide adhesive" is disclosed, but there is no description in the reference pertaining to "polyester-amides" mentioned on page 5, line 3 of the Office Action. A polyester-amide is considered to be different from a "polyamide."

In view of the above, it is respectfully submitted that one of ordinary skill in the art would not consider to combine Kube, Greco and Carlson et al.

Based on the above, even if Carlson et al. is combined with the teachings of Kube and Greco, it is respectfully submitted that one of ordinary skill in the art would not arrive at applicants' present claims.

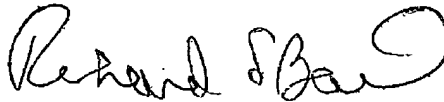
It is therefore respectfully submitted that applicants' present claims are not rendered obvious over the references, either singly or combined in the manner relied upon in the Office Action, in view of the many distinctions discussed hereinabove. Withdrawal of each of the 35 USC 103 rejections is thus respectfully requested.

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Reconsideration is requested. Allowance is solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below.

Respectfully submitted,



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Enclosure: PETITION FOR EXTENSION OF TIME